Are Your Trees Healthy?

To support the City's Comprehensive Plan goals of serving as a leader in environmental stewardship of the natural environment and maintaining and improving the City's forested character, the City of Sammamish has contracted with American Forest Management to create this citizen-focused brochure on identifying the Sammamish area's four most common root rot diseases.

There are native root rotting pathogens that exist in our forests that infect coniferous tree species. Deciduous species are usually not affected. These fungal pathogens play a vital role in our forest ecosystems and are not necessarily bad. Unfortunately, trees that succumb to these pathogens can become unstable or hazardous.

A variety of factors can influence tree health. Insects, drought, soil disturbance, and root rot are some of the reasons your trees may decline in health.

The diagnosis of root diseases is difficult and can rarely be made on the basis of aboveground symptoms, especially when the tree is in the early stages of the disease. The decline of a tree affected by root disease usually extends over a period of a few to several years. In most cases, the declining tree is attacked by insects or subject to wind-throw and fails before dying from the root disease itself.

How does the disease spread?

Root diseases are primarily spread underground when roots from healthy trees come into contact with disease infected roots. The intensity of the spread of the disease, the progression of the decay of roots and the lower trunk, and rate of tree mortality vary by pathogen.

Annosus Root and Butt Rot

Heterobasidion occidentale

Most conifers are susceptible to Annosus. Damage varies greatly by tree species. Western hemlock is the most damaged in our region.

This pathogen is the most difficult to detect. Most infected trees do not show aboveground symptoms. The fungal fruiting bodies often occur inside decayed wood hollows or in root crotches below the duff layer inhibiting identification. In advanced stages of the disease, decay can extend several feet up into the lower trunk, usually causing trunk failure

Indicators of Annosus

- Thin and unhealthy (yellowing) foliage
- Decay at root crown or one or more dead and decayed roots
- Look for dead trees, standing and down, in groupings. Often the root disease travels from old stumps to live trees.
- Fruiting bodies in stumps on nearby dead trees

Laminated Root Rot

Phellinus sulphurascens

Most conifers are susceptible to Laminated Root Rot. Douglas fir is highly susceptible and the most damaged in our region.

Early signs of infection include reduced tree growth and height. Unfortunately, by the time indicators such as yellowing foliage and crown thinning become apparent, the root system has completely rotted away.

Trees infected with Laminated root rot are highly susceptible to wind-throw or blow-down. When they fail, usually only a small root ball or root wad exists. Like the other root rotting pathogens, early detection is difficult.

The disease kills susceptible hosts by either predisposing them to wind-throw by rotting the major roots, or by mortality, by destroying their ability to take up water and nutrients by killing roots.

The disease is normally found in pockets or groups of trees, as the infection is spread from one tree to another. A host species within 30' of a known infected tree can also assumed to be infected to some degree. These infection centers create gaps or openings where native immune hardwood species regenerate and replace the host species.

Armillaria Root Disease

Armillaria ostoyae

All conifers can be infected with Armillaria. In our region, Douglas fir is most susceptible. Armillaria is the most common root rot pathogen in the Pacific Northwest.

Identifiable Symptoms:

- Heavy sap flows or resin soaked bark on the lower tree trunk
- Crown thinning
- Dying tree top
- Honey mushrooms near the base of the tree (only present in autumn)

Resin-soaked bark of Douglas fir

The disease is identifiable by white mycelial sheets (resembling dried latex paint), often shaped like fans, that grow between the wood and bark. Removing the bark will reveal the mycelium as pictured below.

Unlike Laminated root rot, trees infected with Armillaria are not readily wind-thrown and can exist as dead snags for many years.

Schweinitzii Root and Butt Rot

Phaeolus schweinitzii

Although most conifers are susceptible, Douglas fir seems to be the most damaged. Older trees greater than 75 years are most at risk. Common names include the “velvet top fungus” and “cow-pie fungus.”

The disease starts in the roots and progresses into the lower trunk, rotting the heartwood. An indicator of infection is swelling of the lower trunk, known as “Juggbutt,” pictured below.

Fruiting bodies are the most reliable indicator of disease infection. A fruiting body near the base of the tree trunk or on the tree itself indicates an advanced infection. A fruiting body several feet from the trunk may indicate an early infection where only one root has been infected. The number and location of fruiting bodies and swelling of the trunk are key indicators to the degree of internal root and stem decay.

New fruiting bodies appear in late summer and in autumn and can persist for years.

The symptoms and signs of root disease infection are similar for all pathogens: thinning foliage, reduction in growth, resin-soaked bark at the root crown. Identifying root disease pathogens and their implications is a specialized science.

If you think you have root disease issues on your property, find a local ISA certified arborist to conduct a Tree Risk Assessment and provide mitigation options through the resources below.

http://www.treesaregood.org/
http://www.asca-consultants.org/
www.isa-arbor.com/TRAQ

Unfortunately, there are no means to slow or stop the spread of root rotting pathogens. Mitigation efforts usually involve replacing the host species with a species immune (hardwoods) or resistant (Western red cedar) to the pathogen. The best defense against root disease is to maintain a diversity of native tree species and ages in the landscape.

References Cited:

- Field guide to the Common Diseases and Insect pests of Oregon and Washington Conifers, USDA Forest Service
- Laminated Root Rot in Western N America, USDA Forest Service
- Common Fungi Affecting Pacific Northwest Trees, 8 Dunster & Assoc. Ltd

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